

A collection of birds from the Cardamom Mountains, Cambodia, including a new subspecies of *Arborophila cambodiana*

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As part of a wider exploration effort to determine the biological importance of the Cardamom Mountains, Cambodia, and to identify priority species and habitats for conservation, we undertook fieldwork on two hitherto unexplored mountains in the Mount Samkos Wildlife Sanctuary during February and March 2000. During the survey a total of 166 bird species were recorded either by trapping or direct observation, including two threatened species (Chestnut-headed Partridge *Arborophila cambodiana* and Green Peafowl *Pavo cristatus*) and 15 species new for Cambodia. In total, 52 skins, one wing, 28 complete and 35 incomplete alcohol specimens and 35 tissue samples were collected. This collection contains two specimens of the Chestnut-headed Partridge intermediate between the two known subspecies *A. c. cambodiana* and *A. c. diversa* and therefore distinctive enough to be described as a new subspecies. In comparison with the Da Lat Plateau EBA in Vietnam, the same bird-feeding guilds were present, although represented by fewer genera. The geographic factors most likely to have led to the evolution of a depauperate avifauna in the Cardamom Mountains are their isolation from other ranges in Indochina, their relatively low height, and the small overall area of habitat above 1,500 m. Nevertheless, the occurrence of two restricted-range species (Chestnut-headed Partridge and Cambodian Laughingthrush *Garrulax ferrarius*) in the Cardamom Mountains means the Thailand-Cambodia Mountains Secondary Area (s085) does now meet the minimum criteria for an EBA and the area should be considered to be of elevated conservation concern. However, within an Indochinese context the Cardamom Mountains cannot be considered to be a major centre of bird endemism.

INTRODUCTION

From January to April 2000 a multi-disciplinary team of field scientists participated in the first comprehensive exploration of the Cardamom Mountains in Cambodia. The expedition was organised by Fauna and Flora International in collaboration with the Department of Forestry and Wildlife and the Ministry of Environment of the Kingdom of Cambodia. The expedition was undertaken at the request of the Government of the Kingdom of Cambodia to determine the biological importance of the Cardamom Mountains and to identify priority species and habitats for conservation, especially within the Mount Samkos Wildlife Sanctuary. The ornithological team undertook fieldwork on Mount Tumpor (12°22'N 103°02'E) and Mount Khmaoch (12°09'45"N 103°00'45"E), two hitherto unexplored mountains in the Cardamom range, during February and March 2000. The results of the whole expedition, including a summary of the ornithological studies, have already been published (Steinheimer *et al.* 2000). The purpose of this paper is to provide a full and detailed account of the ornithological results of this expedition. We additionally review the levels of avian diversity and endemism in the Cardamom Mountains within a regional context.

The Cardamom Mountains (12°00'N 103°15'E) are located in south-west Cambodia and cover an area of 10,000 km² (Figs. 1 and 2). At its maximum extent the entire mountain range, of which the Cardamom Mountains are part, includes outlying peaks such as

Khao Soi Dao (Khao Soi Dao Wildlife Sanctuary, 13°06'N 102°07'E) and Khao Sa Bap (12°17'N 102°23'E) in south-east Thailand and extends on a north-west-south-east axis to include the Mount Aural massif, and the Elephant range at its most south-easterly extremity. The highest points in the Cardamom

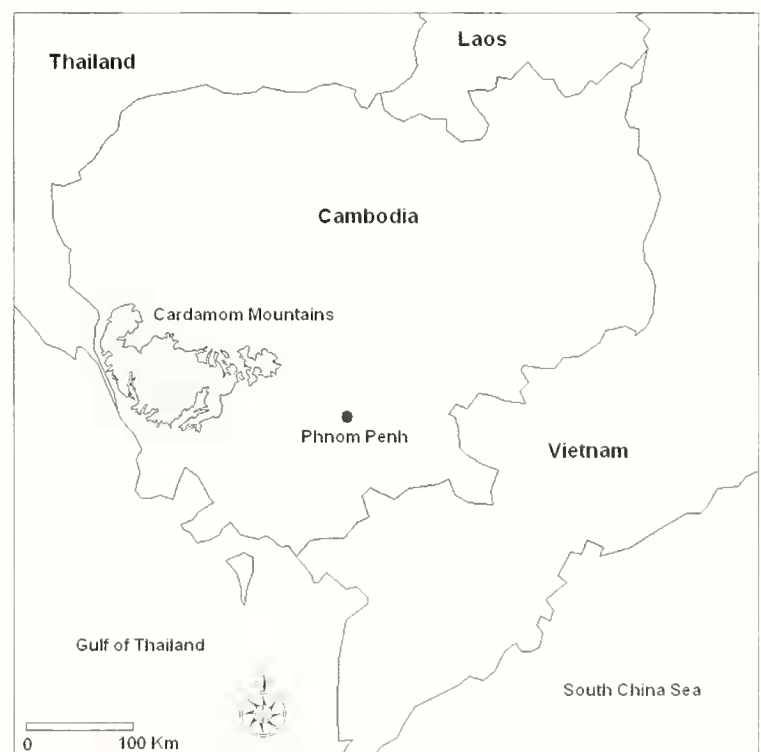


Figure 1. Location of the Cardamom Mountains in Cambodia.

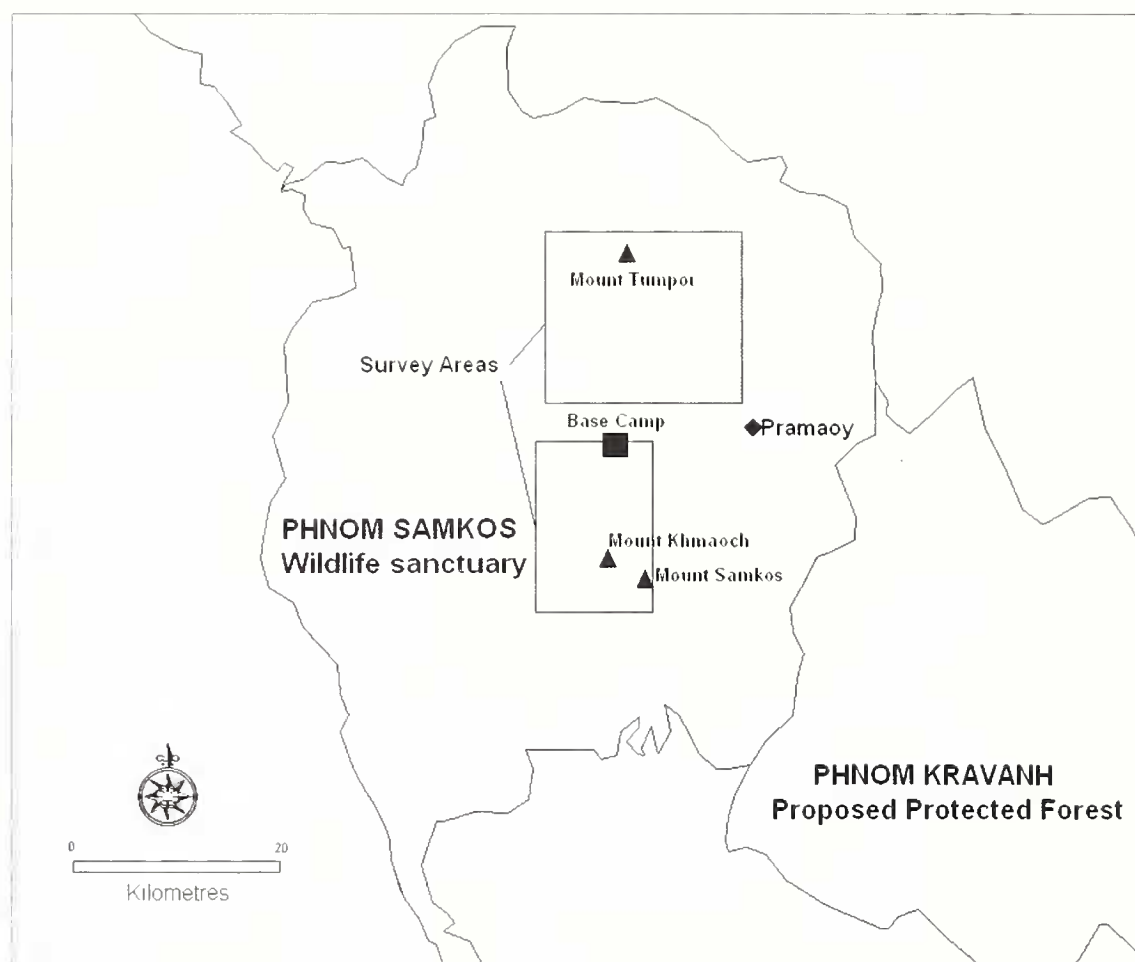


Figure 2. Mount Samkos study area.

Mountains are Mount Samkos ($12^{\circ}09'N$ $103^{\circ}03'E$) at 1,717 m and Mount Aural ($12^{\circ}01'N$ $104^{\circ}14'E$) at 1,771 m. The Cardamom Mountains are located at $11-13^{\circ}$ North and enjoy a tropical monsoon climate. Most rainfall is delivered from April to October by the south-west monsoon. Rainfall in some areas exceeds 4,000 mm per annum (Ashwell 1997). The Cardamom Mountains are covered in tropical evergreen and semi-evergreen forest, and dry deciduous forest in adjoining lowland areas (Fig. 3).

HISTORY OF ORNITHOLOGICAL EXPLORATION

Jean Delacour, Pierre Jabouille and Willoughby Lowe undertook the first ornithological exploration of the Cardamom Mountains during their fourth French Indochina Expedition (Delacour 1933). The expedition collected at the hill station of Bokor (Bokor National Park, $10^{\circ}37'N$ $104^{\circ}03'E$) in the Elephant range during December 1927. Here they collected at 3,000 feet (1,000 m) amid low and stunted forest, the slopes of the escarpment and also at sea-level around the town of Kampot ($10^{\circ}37'N$ $104^{\circ}11'E$; Delacour 1929a, 1929b). During this expedition 21 new taxa were collected and subsequently described, including the following nine endemic forms from Bokor: Silver Pheasant *Lophura nycthemera lewisi*, Chestnut-headed Partridge *Arborophila cambodiana*, Blue Pitta *Pitta cyanea aurantiaca*, Ochraceous Bulbul *Alophoixus ochraceus cambodianus*, White-tailed Robin *Myiomela leucura cambodiana*, Lesser Racket-tailed Drongo *Dicrurus remifer lefoli*, Streaked Wren Babbler *Napothera brevicaudata griseigularis*, White-bellied Yuhina *Yuhina xantholeuca canescens*, and

Buff-bellied Flowerpecker *Dicaeum ignipectus cambodianum* (Delacour and Jabouille 1928).

Whilst engaged in ichthyological studies for the Royal Siamese Bureau of Fisheries, Dr Hugh M. Smith devoted his leisure time to collecting birds. Between 1923 and 1934 he sent a total of 6,459 bird skins, 96 bird skeletons and 43 birds' eggs to the United States National Museum (USNM, Smithsonian Institution: Deignan 1938a, b, Riley 1938). During the winter of 1929-1930 Smith made a collection of birds from south-east Siam, including the mountains along the Siamese-Cambodian border. Smith reached Khao Sa Bap ($12^{\circ}17'N$ $102^{\circ}23'E$), Chantabun (Chanthaburi) province, an isolated peak a little over 1,000 m, on 5-9 January 1930. He described this peak after a further visit between 23 October and 26 November as 'being in a primeval condition' (Riley 1938). In 1930 Smith presented his collection to the USNM and subsequently Riley published type descriptions of a new form of Chestnut-headed Partridge *Arborophila diversa*, (although the designation of this form as a valid species was subsequently withdrawn by the author: Riley 1938), Cambodian Laughingthrush *Garrulax ferrarius* and Fire-breasted Flowerpecker *Dicaeum (umbratile) cambodianum* (Riley 1940). The partridge and flowerpecker were collected at Khao Sa Bab (*sic*) in Chanthaburi province, and the laughingthrush was collected at Khao Kuap, near Krat ($12^{\circ}14'N$ $102^{\circ}30'E$; Riley 1930, 1938). This locality was placed in Thailand by both Deignan and Riley (Riley 1930, 1938, Deignan 1964). A justification for believing that the type locality lies within Cambodia has recently been published (Round and Robson 2001). Subsequently in 1933 Riley published a short note describing Mountain Bulbul *Hypsipetes mccllellandii canescens* from Khao Kuap, Krat



Figure 4. Ventral view of the type specimens of *Arborophila cambodiana chandamonyi* (Holotype BMNH 2000.5.1 adult female collected at 1,250 m on Mount Tumpor (12°22'N 103°02'E), Pursat province, Cambodia, on 5 March 2000; and Paratype BMNH 2000.5.2 adult unsexed collected at 1,500 m on Mount Khmaoch (12°09'45"N 103°00'45"E), Pursat province, Cambodia, on 19 March 2000. Photo: H. Taylor © The Natural History Museum.



Figure 3. View of Mount Samkos summit from Mount Khmaoch. Photo: J. C. Eames.



Figure 5. Profile view of holotype of *Arborophila c. chandamonyi* (BMNH 2000.5.1). Photo: J. C. Eames.



Figure 6. Dorsal view of holotype of *Arborophila c. chandamonyi* (BMNH 2000.5.1). Photo: J. C. Eames.

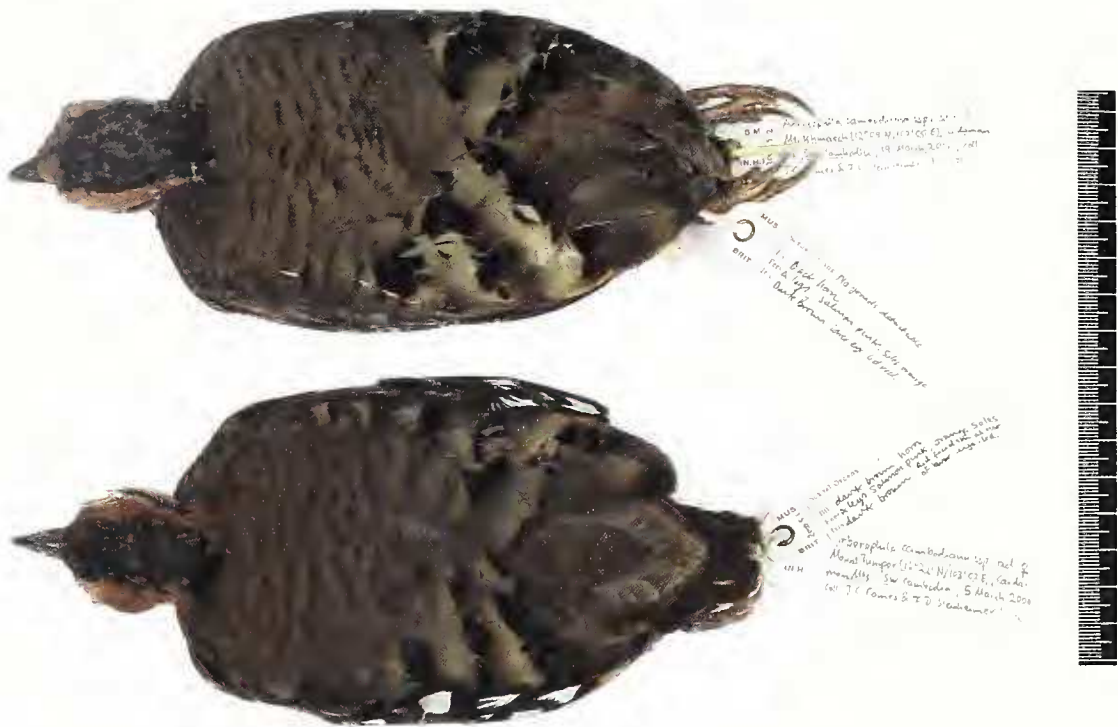


Figure 7. Dorsal view of the types of *Arborophila cambodiana chandamonyi* (BMNH 2000.5.1 and BMNH 2000.5.2). Photo: H. Taylor © The Natural History Museum.



Figure 8. Male Silver Pheasant *Lophura nycthemera lewisi* (BMNH 2000.5.4). Photo: J. C. Eames.



Figure 9. Cambodian Laughingthrush *Garrulax ferrarius* (BMNH 2000.5.32). Photo: J. C. Eames.



Figure 10. Blue-winged Minla *Minla cyanouroptera rufodorsalis* (BMNH 2000.5.35 and BMNH 2000.5.36). Photo: J. C. Eames.

province, south-eastern Siam, and Streaked Wren Babbler *Napothera brevicaudata cognata* (= ssp. *griseigularis*) from Khao Sa Bab, Chantabun (Chanthaburi) province (Riley 1933). In autumn 1933 Smith paid another visit to Khao Sa Bab, collecting, amongst others, additional specimens of *Arborophila diversa*. The visit also resulted in the discovery and description of a presumed new taxon of Asian Paradise-flycatcher *Terpsiphone paradisi sababensis* (Riley 1934). Further diagnosis by Riley of the collection made by Smith at Khao Sa Bab resulted in the description of Lesser Yellow-nape *Cirropicus chlorolophus conjunctus* syn. of *Picus chlorolophus annamensis* and Long-tailed Broadbill *Psarisomus dalhousiae cyanicauda* (Riley 1935). Finally, based on specimens collected by Smith at Khao Seming and Khao Khuap, Krat, in 1928 and 1929, Riley described a form of Mountain Fulvetta *Alcippe (nipalensis) peracensis eremita* (Riley 1936) and Deignan (1938b) described a new form of Grey-chinned Minivet *Pericrocotus solaris nassovicus*.

In 1935 and 1936 Dr P. Engelbach made observations around Kampot and at Bokor in the Elephant range (Engelbach 1938). Engelbach noted the absence of woodpeckers Picidae and noted that Chestnut-headed Partridge was common from 400-1,000 m. Subsequently, in April 1944 he undertook a 50-day exploration of the central Cardamom Mountains beginning at Sre Umbell (11°08'N 103°46'E) on the coast 100 km from Kampot, journeying along the Russey River and terminating at Tnal Krabei on the coast, 200 km north-west of Kampot. Engelbach's route encompassed a variety of habitats including riverine, agricultural land, open deciduous forest as well as evergreen forest. Notable were his observations of White-shouldered Ibis *Pseudibis davisoni*, White-winged Duck *Cairina scutulata* and Milky Stork *Mycteria cinerea* (Engelbach 1940). At 1,100 m on 14 April 1944 Engelbach collected a male and female Blue-winged Minla *Minla cyanouroptera*, which he immediately

recognised as a distinctive new form and later described as *M. c. rufodorsalis* (Engelbach 1946).

In 1961 Bernard R. Feinstein from the Smithsonian Institution made a collection from Kirirom (Kirirom National Park, 11°20'N 104°03'E) in the Elephant range. During his trip to Cambodia Feinstein collected 66 bird specimens between 31 March and 7 April 1961 (USNM Feinstein collection, reg. no. 475272-475337). No new forms were described from his collection.

More recently a bird survey was undertaken in Ream, Kirirom and Mount Bokor National Parks (Goes *et al.* 1998, Neath *et al.* 2001), and details of recent sight records have been frequently published (e.g. Poole and Sun Hean 1999, Davidson 2000, Goes 2000a).

METHODOLOGY

A major objective of our expedition was to determine the bird species diversity of the Cardamom Mountains by making observations and a representative collection of skins and tissue. The locations, altitudes, habitat, and dates surveyed for fieldwork sites are detailed in the Appendix.

We used mist-nets to catch under- and middle-storey species and supplementary snares to catch terrestrial species, but most middle-storey and canopy-dwelling species were observed only. Mist-nets were operated in lower montane evergreen forest at 1,250 m on Mount Tumpor (12°22'N 103°02'E) during 28 February-6 March 2000 (210 m for 78 hours, giving 16,380 mist-net metre-hours) and at 1,450 m within 1 km of the summit of Mount Khmaoch (12°09'45"N 103°00'45"E) during 12-20 March 2000 (150 m for 68 hours giving 11,340 mist-net metre-hours). Mist-nets were controlled hourly and were opened from dawn to dusk. All birds were photographed, identified to species, aged and sexed where possible, and assessed for breeding condition and moult. Most of the birds

Table 1. Bird species new for Cambodia in January-April 2000.

Taxon	Comments
WHITE-BROWED PICULET <i>Sasia ochracea reichenowi</i>	Two specimens collected
JAVAN FROGMOUTH <i>Batrachostomus javensis</i>	Heard only
DARK-SIDED THRUSH <i>Zoothera marginata</i>	One specimen collected
SNOWY-BROWED FLYCATCHER <i>Ficedula hyperythra annamensis</i>	Seven specimens collected
SLATY-BACKED FLYCATCHER <i>Ficedula hodgsonii</i>	One specimen collected
LITTLE PIED FLYCATCHER <i>Ficedula westermanni langbianis</i>	One specimen collected
FUJIAN NILTAVA <i>Niltava davidi</i>	Sight record only
GREEN COCHOA <i>Cochoa viridis</i>	Heard only and song tape-recorded
MOUNTAIN BULBUL <i>Hypsipetes mccllellandii canescens</i>	Four specimens collected
GREY-BELLIED TESIA <i>Tesia cyaniventer</i>	Two specimens collected
WHITE-TAILED LEAF WARBLER <i>Phylloscopus davisoni intensior</i>	Four specimens collected
GREY-CROWNED WARBLER <i>Seicercus tephrocephalus</i>	One specimen collected
CHESTNUT-CROWNED WARBLER <i>Seicercus castaniceps stresemanni</i>	Two specimens collected
LARGE SCIMITAR BABBLER <i>Pomatorhinus hypoleucos tickelli</i>	Two specimens collected
PYGMY WREN BABBLER <i>Pnoepyga pusilla annamensis</i>	Two specimens collected

trapped were subsequently released. However, a representative collection was made. Criteria for collection included any taxon believed to represent an undescribed form, taxa new for Cambodia or new for the Cardamom Mountains, and finally taxa absent or under-represented in the collection of the Natural History Museum (NHM), Tring, U.K., formerly the British Museum of Natural History (BMNH). Specimens were prepared in the field either as study skins or preserved as spirit specimens in 80% ethanol. Tissue samples were taken from nearly all specimens made into study skins and deposited in 98% ethanol. The cadavers of 70% of all skins prepared were also deposited in ethanol. Standard biometric data were recorded for each specimen.

When not controlling mist-nets, active searches were carried out, weather permitting. Trails in the forest and logging roads were walked slowly and deliberately, with frequent stops to observe mixed-species feeding flocks or birds feeding at fruiting trees, and with frequent imitation of the call of Collared Owlet *Glaucidium brodiei* using a bamboo whistle to incite mobbing by birds.

RESULTS

During the survey a total of 166 bird species were recorded (see Appendix). This included two threatened species, Green Peafowl *Pavo muticus* (Vulnerable) and Chestnut-headed Partridge (Endangered), and one Near Threatened species, Great Hornbill *Buceros bicornis* (BirdLife International 2001). A total of 15 species were new for Cambodia (Table 1). A short paper has recently been published using our data by Davidson (2000), in which reference is made to three other possible 'firsts' (Grey-chinned Minivet *Pericrocotus solaris*, Spot-throated Babbler *Pellorneum albiventris* and Rufous-throated Fulvetta *Alcippe rufogularis*) which we consider now to be unreliable sight records. Records of Javan Frogmouth *Batrachostomus javensis* were mentioned as unconfirmed in Net Neath *et al.* (2001).

Of the 15 species in Table 1, specimens were obtained of 12 species, which are described in detail below. Fujian Niltava *Niltava davidi* was recorded as a sight record and Javan Frogmouth and Green Cochoa *Cochoa viridis* were heard only. The song of the latter species was tape-recorded. In total, 52 skins, one wing, 28 complete and 35 partial alcohol specimens and 35 tissue samples were collected. With the kind permission of the Royal Cambodian Government this entire collection was presented to the NHM. Diagnosis of the entire collection was made during 2000 and 2001 by JCE and FDS. Additionally during 2000 and 2001 JCE visited the American Museum of Natural History, New York (AMNH) and the United States National Museum, Washington D.C. (USNM), and FDS visited the Muséum National d'Histoire Naturelle, Paris (MNHN).

Annotated list of specimens collected

Our collection added four new taxa to the NHM collection, comprising four additions to the skin collection, 24 additions to the spirit collection and 27 additions to the tissue collection. The following section comprises a detailed account of the skin specimens

collected during the expedition, which are restricted-range subspecies and/or first records for Cambodia and/or undescribed in full in the literature (additional specimens are listed in Table 2). In these cases the specimen number, sex and date of collection, and full biometrics are provided. Specimens were measured in the field at the time of collection and re-measured later at NHM and comprised: length of maxilla from its tip to the base of the skull, maximum wing chord, tarsus length (measured from the ankle joint to the last complete scutum), tail length (from tail-tip to the end of the pygostyle) and mass. A description of the soft-part coloration is also provided. Plumage descriptions follow Smithe (1975). Registration numbers prefixed with a capital A are for alcohol-stored specimens; if a conventional number and a prefixed one are given for the same bird, then the body and a tissue sample of the skin specimen are additionally kept in alcohol.

CHESTNUT-HEADED PARTRIDGE *Arborophila cambodiana*
A series of two collected from Mounts Tumpor and Khmaoch (Steinheimer *et al.* 2000, Steinheimer 2002) were compared with ten specimens including the two syntypes and six paratypes of the nominate form, a topotype, additional specimen of *A. c. diversa* and several photographs. The specimens from Mounts Tumpor and Khmaoch are sufficiently distinct to be named as

Arborophila cambodiana chandamonyi subsp. nov.

Holotype BMNH registration number 2000.5.1. Adult female collected at 1,250 m on Mount Tumpor (12°22'N 103°02'E), Pursat province, Cambodia, on 5 March 2000. Body in spirit collection registered number A/2000.8.1. Tissue sample deposited. See Figs. 4-7.

Paratype BMNH registration number 2000.5.2. Adult unsexed (no gonads located) collected at 1,500 m on Mount Khmaoch (12°09'45"N 103°00'45"E), Pursat province, Cambodia, on 19 March 2000. See Figs. 4 and 7.

Diagnosis This new form, showing a well-defined black crown sparsely maculated with chestnut, is intermediate between the two previously described forms. The colour pattern of the mantle of our specimens is shared with *A. c. diversa*, while the intensive chestnut colour of the face, throat and breast combined with the lack of a clear black necklace and the general underpart pattern are consistent with *A. c. cambodiana*.

The holotype of *Arborophila cambodiana chandamonyi* conforms in plumage pattern and level of colour saturation to the nominate form. It differs in showing less well-marked underparts, particularly in reduced levels of black. It differs from the holotype of *A. c. cambodiana* in the absence of black tips to the feathers of the throat. The upper breast is a little richer orange but the lower breast lacks the broad white feather centres and the black subterminal borders shown by the nominate form. The holotype and paratype of the new form show less black subterminal fringes on the underparts. The upperparts of the nominate form differ from this new form in having a solid black crown and

the nape, mantle, back, scapulars and predominantly black wing-coverts with only narrow olive-buff subterminal tips. The female syntype of *A. c. cambodiana* shows less black but its extent is still significant. The extent of the black in the other two males of the nominate form examined approaches the male syntype. The new form differs from *A. c. diversa* in showing greater orange saturation. The topotype of *A. c. diversa* examined has the feathers of the lower throat broadly tipped with black. The rest of the underpart pattern is similar in *A. c. cambodiana* and *A. c. diversa* although *A. c. diversa* shows more black. The upperparts of *A. c. diversa* do not differ significantly from the new form except that *A. c. diversa* shows much less orange on the head, and has black fringes to the feathers of the chin, throat and cheeks. The crown and nape of *A. c. diversa* show only narrow black feather centres and tips.

Description of holotype Forehead and lores Raw Sienna (136). Crown and nape Antique Brown (37) broadly tipped Jet Black (89) and mottled, giving the impression of a largely black crown. The cheeks are close to Tawny (38) but are a little darker and redder. The chin and throat are also Tawny (38) but a little paler. The lower throat and jugulars are not easily colour-matched but are closest to Raw Sienna (136) grading to Burnt Sienna (132). At the sides of the breast some feathers are tipped Jet Black (89). The breast is Raw Sienna (136) with Olive Brown (28) tones on the sides of the breast, becoming paler on the belly and undertail-coverts. The feathers of the lower breast and belly have off-white central shaft-streaks bordered by indistinct rows of small blackish spots. The off-white feather centres become broader forming tear-shaped spots on the belly and flanks. The flank feathers have broad black borders producing a pronounced scaled effect. From behind the eye there is a narrow sepia line along the side of the neck terminating as spots on the side of the throat. The mantle, back and rump are Raw Umber (123) but with a Brown Olive (29) cast and Antique Brown (37) subterminal tips and black tips (although these are absent on the rump), creating a finely barred effect. The primaries are Sepia (119) with very narrow Tawny (38) fringes to the outer web and Sepia (119) spotting towards the tip, the spotting and fringing becoming broader on the secondaries. The lesser and median coverts are broadly fringed Raw Umber (123) with Smoke Grey (45) centres and blackish basal halves, especially on the inner webs. The scapulars are Smoke Grey (45) fringed Raw Sienna (136). The inner web has a narrow to broad black subterminal fringe approaching Chestnut (32) but a little more orange. This pattern becomes more prominent on the lower scapulars. The greater coverts are Raw Umber (23) narrowly fringed Tawny (38), tipped Smoke Grey (45) with the inner web Dusky Brown (19) with some irregular flecks on the outer webs. The secondaries are Sepia (114) broadly tipped Antique Brown (37) with irregular flecking. The undertail-coverts are Tawny (38) with more Cinnamon (39) admixed.

Paratype variation The paratype differs principally in the level of colour saturation of both the upperparts, which have reduced orange-chestnut tones, and is a colder and more olive tone. The most striking difference is the

colour of the underparts. In the paratype the feathers of the lower throat are broadly tipped black producing a narrow black necklace, separated from the breast by a jugulars, intermediate in colour as in the holotype. The coloration of the breast is intermediate between Mikado Brown (121c) and Cinnamon (39). The black spotting and blackish subterminal fringes are more extensive and more pronounced. The lower belly to the vent is creamy-white fringed Tawny Olive (223d) with indistinct rows of broken barring Vandyke Brown (221). The face, chin and throat are also less saturated orange and in ground colour approach Cinnamon (39) more closely.

Measurements and bare-part coloration: Holotype Maxilla (tip to skull) 19.3 mm, wing (max chord) 140 mm, tarsus length 36 mm, tail length 61 mm, weight 283 g. Bill dark brown-horn, feet and legs salmon-pink with orange soles, iris dark brown, red facial skin at rear of lower eye-lid. *Paratype* Maxilla (tip to skull) 22 mm, wing (max. chord) 151 mm, tarsus length 38 mm, tail length 63 mm. Bill black-horn, feet and legs salmon-pink with orange soles, and iris dark brown, lower eye-lid red.

Mean measurements of A. c. cambodiana (n = 10) in comparison with Holo- and Paratype (n = 2). Maxilla (tip to skull) 20.94 mm (range: 19.0-22.4 mm; *vs* mean for *A. c. chandamonyi*: 20.6 mm), wing (max. chord) 142.7 (133-160) *vs* *chandamonyi* mean 145.5 mm, tarsus length 36.75 (32.8-39.8) *vs* *chandamonyi* mean 37 mm, tail length (measured with flat ruler down to vent, not comparable to the measurement above, which are taken on the fresh dead bird) 49.8 mm (133-160) *vs* *chandamonyi* mean 145.5 mm.

Ecology and behaviour On Mounts Tumpor and Khmaoch this taxon was typically observed in pairs. It was not shy and on 5 March 2000 a pair were observed at 5 m. Typically for this genus, a pair performs the song as a duet. The song begins as a series of widely spaced couplets, at first on a monotone, slowly, then increasing in pitch and then abruptly stopping. The second bird then gives a rapid series of *chip* notes. On Mounts Tumpor and Khmaoch the song was heard daily.

Habitat On Mounts Tumpor and Khmaoch this taxon was typically found in lower montane evergreen forest. On 5 March 2000 a pair were observed crossing a stream bed at forest edge.

Distribution This species is endemic to the mountains of south-east Thailand, the central Cardamom and Elephant ranges. Within the Cardamom Mountains the population of *Arborophila c. chandamonyi* is currently known only from the Samkos range, Pursat province. It may occur towards the Thai border, and further south-east in the central Cardamom Mountains (Phnom Kravanh region, Koh Kong province), at 400-1,400 m (Engelbach 1938, Goes 2000b). This central range is discrete and isolated from the Elephant range as well as from the Thai mountains of Khao Soi Dao, Krat province, by areas at lower altitudes (<300 m: Daltry and Momberg 2000), but hardly anything is known about the altitudinal distribution of this species. The north-western and south-eastern populations of this species may either represent a gradual cline or *A. c.*

cambodiana, *A. c. chandamonyi* and *A. c. diversa* may be consistent in plumage character expression with a high level of individual variation existing only within the contact zone (J. Fjelds  in litt. 2002). In describing an additional new form we concede that we have side-stepped this issue and left this question to be addressed by others. It will remain unresolved until further research has taken place in the Kirirom and Mount Aural areas to establish fully the range of this species. Our description of a new form strongly indicates that *A. c. diversa* is not a distinct species as recently stated (*contra* Robson 2000), but belongs within *A. cambodiana*. This was also the conclusion of Riley (1938), who noted the level of variation within and across *A. cambodiana* and subsequently subsumed *A. diversa* in *A. cambodiana* (see also Amadon and Short 1992).

Etymology This subspecies is named in honour of our colleague Meas Chandamony of the Department of Forestry and Wildlife who very sadly contracted malaria and died during the expedition.

Specimens examined: *A. c. cambodiana*: BMNH 1928.6.26.3 (syntype) 14 December 1927, male, Bokor, Cambodia; BMNH 1928.6.26.4 (syntype), 16 December 1927, female, Bokor, Cambodia; BMNH 1928.6.26.125 (paratype), 13 December 1927, male, Bokor, Cambodia; BMNH 1928.6.26.126 (paratype), 17 December 1927, male, Bokor, Cambodia; MNHN 1929.721 (paratype), 17 December 1927, male, Bokor, Cambodia; MNHN 1929.722 (paratype), 17 December 1927, male, Bokor, Cambodia; MNHN 1929.723 (paratype), 17 December 1927, female, Bokor, Cambodia; MNHN 1929.724 (paratype), 17 December 1927, indeterminate, Bokor, Cambodia; MNHN 1938.82, 14 June 1936, male, Bokor, Cambodia; MNHN 1938.83, 1 April 1935, female, Bokor, Cambodia.

A. c. diversa: USNM 333609 (topotype) 21 November 1933, female, Khao Sa Bab (c.1,000 m), Thailand; USNM 534549, 13 March 1966, male, Khao Soi Dao (c.1,200 m), Thailand; USNM 324093 (holotype, seen as a photograph only), 8 January 1930, male, Khao Sa Bab (c.1,000 m), Thailand; USNM 333610 (photograph), 21 November 1933, female, Khao Sa Bab (c.1,000 m), Thailand; USNM 333611 (photograph), 21 November 1933, female, Khao Sa Bab (c.1,000 m), Thailand; USNM 333612 (photograph), 21 November 1933, male, Khao Sa Bab (c.1,000 m), Thailand; USNM 534550 (photograph), 16 March 1966, female, Chanthaburi, Khao Soi Dao Tai (c.1,160 m), Thailand.

The NHM collection contains the first ethanol-preserved body and tissue sample of this species.

SILVER PHEASANT *Lophura nycthemera lewisi*

BMNH 2000.5.3 Adult female collected at 1,400 m on Mount Khmaoch on 18 March 2000. Maxilla 32 mm, tarsus 73 mm, wing 222 mm, tail 230 mm, bill green-horn, feet and legs scarlet, iris orange. Red facial skin.

BMNH 2000.5.4 Adult male collected at 1,400 m on Mount Khmaoch on 18 March 2000. Maxilla 34.5 mm, tarsus 81 mm, wing 245 mm, tail 334 mm, bill green-horn, feet and legs scarlet, iris orange. Red facial skin. See Fig. 8.

Specimens were compared with the type material at the NHM.

WHITE-BROWED PICULET *Sasia ochracea reichenowi*

BMNH 2000.5.6, A/2000.8.3 Adult male with enlarged testis (4.2 mm x 3.2 mm), collected at 1,270 m on Mount Tumpor on 28 February 2000. Maxilla 13.2 mm, tarsus 15 mm, wing 54 mm, tail 23 mm, weight 8.6 g. Bill: upper mandible slate-grey, lower mandible whitish-grey, towards tip slate. Feet and legs orange, soles yellow, iris intense red, orbital skin blood vinous-red. An additional specimen is kept in spirit (A/2000.8.37).

This is the first record of this species from Cambodia.

GREAT EARED NIGHTJAR *Eurostopodus macrotis cerviniceps*

BMNH 2000.5.5, A/2000.8.2 Juvenile collected at the foot of Mount Khmaoch at 600 m on 11 March 2000. Weight 108 g. Bill light grey with a black tip, feet flesh, and iris dark brown.

As the juvenile of this species has remained undescribed so far (Cleere and Nurney 1998), we here provide a short description of our specimen: wing feathers still in quills (total length of wing 140 mm), blackish-sepia with fine cinnamon-drab stripes and much darker as in adults; however, wing tips cinnamon-drab with blackish dots similar to the adult. Underparts greyish-buff with some darker stripes. Breast similar to adult plumage, being dark brown tipped light hazel, though not so chestnut as in the adult bird. Chin and throat with fine brownish and blackish tones. Tail still in quills (67 mm), similar to adult plumage, but much paler ground colour (between pale horn and pale pinkish-buff). Scapulars with vinaceous-pinkish tones. The main differences from the adult bird are the upperparts (from forehead to rump) having pale pinkish-buff feathers, which are distally spotted with black. This feature is known from the crown in adult birds only.

BESRA *Accipiter virgatus affinis*

BMNH 2000.5.53 [wing only] Adult male collected at 1,250 m on Mount Tumpor on 29 February 2000.

This single wing confirms the subspecies *A. v. affinis* for Cambodia (cf. Engelbach 1949: 13).

ORANGE-HEADED THRUSH *Zoothera citrina innotata*

BMNH 2000.5.19, A/2000.8.12 Adult male undeveloped testis (max. 2.2 x 1.6 mm) collected at 1,270 m on Mount Tumpor on 1 March 2000. Maxilla 24.3 mm, wing 114 mm, tarsus 31.1 mm, tail 73 mm, weight 66 g. Bill: upper mandible slatish, lower mandible whitish to slatish; feet pale flesh, iris dark brown.

DARK-SIDED THRUSH *Zoothera marginata*

BMNH 2000.5.20, A/2000.8.13 Adult female collected at 1,250 m on Mount Tumpor on 1 March 2000. Maxilla 35.1 mm, wing 126 mm, tarsus 27 mm, tail 78 mm, weight 82 g. Bill: upper mandible dark horn, lower mandible paler horn; feet pale flesh-horn, iris very dark brown.

This is the first record of this species from Cambodia.

SLATY-BACKED FLYCATCHER *Ficedula hodgsonii*

BMNH 2000.5.48, A/2000.8.31 Adult male testis undeveloped collected at 1,270 m on Mount Tumpor on 2 March 2000. Maxilla 10.6 mm, wing 67 mm, tarsus

14.8 mm, tail 52 mm, weight 8.5 g. Bill dark slatish, feet flesh, and iris dark brown.

This is the first record of this species from Cambodia and extends the known range of the species in South-East Asia (cf. Robson 2000).

SNOWY-BROWED FLYCATCHER *Ficedula hyperythra annamensis*

BMNH 2000.5.45 Adult male enlarged testis (max. 2.9 x 2.1 mm) collected at 1,270 m on Mount Tumpor on 29 February 2000. Maxilla 12.2 mm, wing 56 mm, tarsus 20.6 mm, tail 41 mm, weight 7.5 g. Bill black, feet light grey, iris not noted.

BMNH 2000.5.46, A/2000.8.29 Adult female collected at 1,270 m on Mount Tumpor on 1 March 2000. Maxilla 11.8 mm, wing 56 mm, tarsus 17.8 mm, tail 30 mm, weight 9.5 g. Bill slate, feet pale pink to flesh-coloured, and iris very dark brown.

BMNH 2000.5.47, A/2000.8.30 Adult male enlarged testis (max. 2.9 x 2.5 mm) collected at 1,270 m on Mount Tumpor on 2 March 2000. Maxilla 10.3 mm, wing 61 mm, tarsus 18.2 mm, tail 42 mm, weight 7.5 g. Bill black, feet light flesh, iris very dark brown. Four additional specimens, A/2000.8.55-58, are kept in spirit.

The two male skins differ from two males (including the syntype at NHM) of the subspecies *Ficedula h. annamensis* from Mount Langbian, Vietnam, in having the outer web of the secondaries, and, to a lesser extent, also of the primaries, plumbeous-brown with an indigo-blue sheen (instead of hair-brown with a cinnamon sheen). The forehead at the base of the bill and especially the lores of the Cambodian specimens are bluish-black, compared with more slatish-blue in the other specimens. The Cambodian specimens match in these characters a single male specimen from Ngoc Linh, Kon Tum province, Vietnam (BMNH 1997.7.4; for locality description see Eames *et al.* 1999). The female specimen differs from the female syntype of this subspecies in having an orange-buff supercilium and forehead (instead of pure light buff). These are the first records of this species for Cambodia.

LITTLE PIED FLYCATCHER *Ficedula westermanni langbianis*

BMNH 2000.5.49, A/2000.8.32 Adult male enlarged testis (max. 3.9 x 2.9 mm) collected at 1,270 m on Mount Tumpor on 2 March 2000. Maxilla 12.0 mm, wing 59 mm, tarsus 16.4 mm, tail 46 mm, weight 7 g. Bill black, feet dark slate, iris very dark brown.

The specimen was compared with the type of this subspecies at the NHM and represents the first record of this species from Cambodia.

WHITE-TAILED ROBIN *Myiomela leucura cambodiana*

BMNH 2000.5.13, A/2000.8.8 Adult male collected at 1,270 m on Mount Tumpor on 28 February 2000. Maxilla 17.2 mm, wing 91 mm, tarsus 25.5 mm, tail 81 mm, weight 24 g. Bill black, feet black, iris dark brown.

BMNH 2000.5.14 Adult female collected at 1,270 m on Mount Tumpor on 29 February 2000. Maxilla 18 mm, wing 85 mm, tarsus 24.9 mm, tail 68 mm, weight 7.5 g. Bill slate, feet grey, and iris dark brown.

BMNH 2000.5.15 Adult male enlarged testis (max. 3.8 x 4.2 mm) collected at 1,270 m on Mount Tumpor on 29 February 2000. Maxilla 17.4 mm, wing 88 mm,

tarsus 26.9 mm, tail 95 mm, weight 24.5 g. Bill black, feet blackish, iris dark brown.

BMNH 2000.5.16, A/2000.8.9 Adult male collected at 1,250 m on Mount Tumpor on 2 March 2000. Maxilla 17.5 mm, wing 92 mm, tarsus 28 mm, tail 87 mm, weight 25.5 g. Bill black, feet dark brown-horn, and iris black.

BMNH 2000.5.17, A/2000.8.10 Adult male enlarged testis (max. 3.4 x 2.4 mm) collected at 1,200 m on Mount Khmaoch on 15 March 2000. Maxilla 16.1 mm, wing 89 mm, tarsus 28 mm, tail 78 mm, weight 21.5 g. Bill black, feet very dark slate, iris very dark brown. Nine further specimens, A/2000.8.39-47, are kept in spirit.

Description BMNH 2000.5.14 is the first female of this taxon to be collected and is described as follows: Forehead, crown and nape dark olive-brown (no colour match was possible), becoming warmer brown on the mantle, back and rump. Uppertail-coverts dark Raw Umber (123) tipped white. Lores off-white and there is a narrow off-white eye-ring. Cheeks Raw Umber (123) with pale shafts and a little greyer at the feather tip. The sides of the neck are Raw Umber (123), becoming predominantly Glaucous (80) on the belly. The flanks and vent are grey (Glaucous 80) admixed with Raw Umber (123) but appear a colder earth-brown. The chin is off-white with Grey (123) tips, the throat maculated white and Raw Umber, abruptly stopping on the breast, which is pure Raw Umber. Towards the belly the feathers get greyish and finally white. The undertail-coverts are mixed white and light Raw Umber (123) and have white tips. The rectrices are Vandyke Brown (221) with warmer brown fringes to the distal halves of the outer webs of the outer two rectrices. The outermost rectrix (R6) lacks any white. Rectrix 5 has white at the base of the outer web, R4 has the basal third of the outer web white, R3 two-thirds of the outer web white, R2 three-quarters of the outer web white and the innermost rectrix (R1) again has no white. The underside of the rectrices is Olive Brown (28), but with a silvery-grey cast. The lesser, median and greater coverts are Dark Brown Olive (129) admixed with Raw Umber (123). The remiges have their outer webs Brussels Brown (121b), except the innermost primary, which has both webs Brussels Brown (123b). The inner webs of the remiges are Vandyke Brown (221). The underside of the remiges are closest to Olive Brown (28) but with a silvery-grey cast.

Specimens examined BMNH 1928.6.26.10 holotype, 13 December 1927, male, Bokor, Cambodia; MNHN 1929.1443 paratype, 11 December 1927, male, Bokor, Cambodia. The measurements and soft-part colours of the type specimens are: MNHN 1929.1443/BMNH 1928.6.26.10: maxilla 14.9/broken mm, wing 85/87 mm, tarsus 26/24 mm, tail 66/64 mm. Bill black/black, feet black/black, iris brown (for further details see also Delacour and Jabouille 1928: 132-133).

Notes on specimens collected This subspecies was previously known only from the holotype and paratype (both males). Our specimens match the types in the absence of any light blue at the forehead. However, the specimens from Mounts Tumpor and Khmaoch differ in being much darker, especially on the breast and tail

(dark blackish-indigo instead of slightly ultramarine-blue tinged light plumbeous and dark sepia, respectively). The differences might be due to ageing of the type specimens and collecting date, respectively (both from December; ours are from February and March) or may represent real variation between populations. This latter point cannot be clarified without reference to new material from the Elephant range. *Myiomela leucura cambodiana* is the only race of this species that lacks the light blue forehead. The nominate form occurs from Nepal across to southern Vietnam and south to Malaysia, and on Taiwan (doubtfully distinct ssp. *montium*). The morphological differences exhibited by this taxon and its geographical range suggests that it may be a candidate for upgrading to species level. This species was in mating condition (males were very active), whilst the ovaries of birds collected showed slight enlargement. This is the most common bird species in the forest understorey at 1,200–1,400 m on Mounts Tumpur and Khmaoch.

SLATY-BACKED FORKTAIL *Enicurus schistaceus*

BMNH 2000.5.18, A/2000.8.11 Adult male enlarged testis (max. 5.0 x 3.3 mm) collected at 1,250 m on Mount Tumpur on 3 March 2000. Maxilla 19.8 mm, wing 99 mm, tarsus 26 mm, tail 125 mm, weight 27 g. Bill black, feet pale pinkish-horn, iris black.

The specimen has been compared with the type of this species at the NHM. The specimen has white tips of primaries and secondaries as noted on some specimens collected in winter from the NHM collection. These white tips may be related to wear or age but are not sex-related, and occur in specimens across the whole range of the species.

MOUNTAIN BULBUL *Hypsipetes mcclllandii canescens*

BMNH 2000.5.8 Adult male collected at 1,250 m on Mount Tumpur on 29 February 2000. Maxilla 23 mm, wing 99 mm, tarsus 14 mm, tail 103 mm, weight 29.5 g. Bill dark brown-horn, feet and legs purple-flesh, iris orange-brown.

BMNH 2000.5.9 Adult female collected at 1,270 m on Mount Tumpur on 29 February 2000. Maxilla 22.4 mm, wing 95 mm, tarsus 14.2 mm, tail 91 mm, weight 26 g. Bill slate-coloured, feet and legs silver-grey with yellow soles, iris orange-brown.

BMNH 2000.5.10, A/2000.8.5 Adult male enlarged testis (max. 10.9 mm) collected at 1,600 m on Mount Khmaoch on 13 March 2000. Maxilla 21.6 mm, wing 98 mm, tarsus 19.5 mm, tail 93 mm, weight 38.5 g. Bill dark slate, feet greyish-flesh, and iris chestnut.

BMNH 2000.5.11, A/2000.8.6 Adult male enlarged testis (max. 10.3 mm) collected at 1,600 m on Mount Khmaoch on 14 March 2000. Maxilla 22.4 mm, wing 102 mm, tarsus 18.6 mm, tail 97 mm, weight 39.5 g. Bill slate, feet flesh, and iris chestnut.

This species was very common on the summit plateau of Mount Khmaoch. All males collected were in breeding condition. The specimens have been compared with photographs of the type specimen (USNM 324490). These are the first records of this species from the interior of Cambodia (cf. Round and Robson 2001).

GREY-BELLIED TESIA *Tesia cyaniventer*

BMNH 2000.5.37, A/2000.8.24 Adult male collected at 1,250 m on Mount Tumpur on 1 March 2000. Maxilla 14 mm, wing 51 mm, tarsus 24 mm, tail 20 mm, weight 9 g. Bill: upper mandible dark horn, lower mandible yellow-horn, feet pale brown-horn, iris very dark brown.

BMNH 2000.5.38, A/2000.8.25 Adult male enlarged testis (max. 4.1 x 3.2 mm) collected at 1,400 m on Mount Khmaoch on 13 March 2000. Maxilla 10.2 mm, wing 47 mm, tarsus 21.7 mm, tail 17 mm, weight 9.5 g. Bill: upper mandible dark slate, lower mandible yolk-yellow, towards the top slate; feet flesh, and iris dark brown.

The specimens have been compared with the type of this species at the NHM. These are the first records of this species from Cambodia and the most southerly records in South-East Asia (cf. Robson 2000).

WHITE-TAILED LEAF WARBLER *Phylloscopus davisoni intensior*

BMNH 2000.5.39 Adult male enlarged testis (max. 4.2 x 3.0 mm) collected at 1,270 m on Mount Tumpur on 29 February 2000. Maxilla 11.9 mm, wing 55 mm, tarsus 15.3 mm, tail 47 mm, weight 7.5 g. Bill: upper mandible blackish, lower mandible orange; feet light grey, iris brown. Three additional specimens, A/2000.8.52–54, are kept in spirit.

Several specimens in the NHM collection previously identified as *P. d. klossi* match the Cambodian specimen, but would have been collected outside the range of *P. d. intensior* given in Watson (1986). This new specimen may be the only true *P. d. intensior* in the NHM collection. This species is a common resident in the Cardamom Mountains. The specimen (and additional spirit specimens) are the first records of this species from Cambodia.

GREY-CROWNED WARBLER *Seicercus tephrocephalus*

BMNH 2000.5.42, A/2000.8.27 Adult male collected at 1,200 m on Mount Khmaoch on 13 March 2000. Maxilla 11.0 mm, wing 58 mm, tarsus 17.5 mm, tail 45 mm, weight 6 g. Upper mandible light horn, feet yolk-yellow, iris dark brown.

DNA analysis of tissue samples produced a haplotype of *Seicercus omeiensis*, although external morphological features are in fact close to the taxon *tephrocephalus sensu stricto* (Anderson 1871, Martens *et al.* 1999, *contra* Alström and Olsson 1999, identification and pers. comm. J. Martens and S. Eck, 15 January 2002). Our specimen had testis of 1 mm and was therefore not in breeding condition. This specimen is the first record of this species from Cambodia.

PLAIN-TAILED WARBLER *Seicercus soror*

BMNH 2000.5.40 Adult female collected at 1,250 m on Mount Tumpur on 29 February 2000. Maxilla 10.6 mm, wing 56 mm, tarsus 16.1 mm, tail 45 mm. Bill: upper mandible black-horn, lower mandible yellow-horn; feet yellow-flesh, yellow soles, iris blackish.

BMNH 2000.5.41, A/2000.8.26 Adult male collected at 1,200 m on Mount Khmaoch on 12 March 2000. Maxilla 11.5 mm, wing 56 mm, tarsus 17.0 mm, tail 45 mm. Bill: upper mandible brown-horn, lower

mandible yolk-yellow; feet fleshy-yellow, iris very dark brown.

The largest testis of the male measured 1.7 mm and this specimen was therefore not in breeding condition. This species is a winter migrant to the Cardamom Mountains (Alström and Olsson 1999). These skins were independently determined to be this species by J. Martens and S. Eck in February 2001, and by C. R. Robson in April 2000. The specimens have been compared with the type of this species at the NHM.

CHESTNUT-CROWNED WARBLER *Seicercus castaneiceps stresemanni*

BMNH 2000.5.43 Adult male collected at 1,250 m on Mount Tumpor on 29 February 2000. Maxilla 10.4 mm, wing 54 mm, tarsus 17 mm, tail 43 mm. Bill: upper mandible dark horn, lower mandible yellow-flesh; feet flesh-horn, iris black. A second specimen, A/2000.8.59, is retained in spirit.

Our specimens match *S. c. stresemanni* from Laos (BMNH 1932.5.14.101) in having a light grey breast, whitish belly, yellow-green flanks and an intensive yellow rump; however, they differ slightly with their considerably darker, chestnut-coloured head and the lack of clearly defined crown stripes. In the latter character they resemble instead the subspecies *youngi* and *butleri* from the Siamese and Malay Peninsula, respectively. These specimens are the first records of this species from Cambodia.

CAMBODIAN LAUGHINGTHRUSH *Garrulax ferrarius*
BMNH 2000.5.32, A/2000.8.22 Adult male collected at 1,250 m on Mount Tumpor on 1 March 2000. Maxilla 26 mm, wing 129 mm, tarsus 41 mm, tail 120 mm, weight 101 g. Bill black, feet dark grey-horn, and iris dark reddish-brown, facial skin pale china-blue. See Fig. 9.

Our specimen has been compared with a typical specimen (USNM 324310) and photographs of the holotype (USNM 324311), which was also examined in 2001. We follow Riley (1940) and Round and Robson (2001) in treating this taxon as a species but we note that morphologically it resembles very closely Black-hooded Laughingthrush *Garrulax milleti* from Vietnam and Laos.

LARGE SCIMITAR BABBLER *Pomatorhinus hypoleucos tickelli*
BMNH 2000.5.22, A/2000.8.15 Adult male enlarged testis (max. 4.8 x 4.5 mm) collected at 1,270 m on Mount Tumpor on 2 March 2000. Maxilla 44.9 mm, wing 108 mm, tarsus 40 mm, tail 111 mm, weight 82 g. Bill: upper mandible-base slatish, tip milky-white, lower mandible silvery-white; feet light flesh, iris brown.

BMNH 2000.5.23, A/2000.8.16 Adult female collected at 1,250 m on Mount Tumpor on 3 March 2000. Maxilla 39.1 mm, wing 100 mm, tarsus 49 mm, tail 96 mm, weight 69 g. Bill: upper mandible horn, lower mandible pale horn; feet purple-horn, and iris dark brown.

Table 2. List of additional specimens collected: column 2 gives data of alcohol (prefixed with an ‘A’) and skin specimens not mentioned in the accounts above; column 3 indicates whether tissue samples were preserved and of how many individuals.

Taxon	Data	Tissue
<i>Gallus gallus gallus</i>	BMNH A/2000.8.36: pullus, foothills of Mt. Khmaoch, 16 March 2000	-
<i>Serilophus lunatus elizabethae</i>	BMNH 2000.5.7, A/2000.8.4: adult female, Mt. Tumpor, 6 March 2000	1
<i>Rhipidura albicollis cinerascens</i>	BMNH A/2000.8.60: indeterminate, Mt. Tumpor, 29 February 2000 BMNH A/2000.8.61: indeterminate, Mt. Tumpor, 29 February 2000	-
<i>Turdus obscurus</i>	BMNH 2000.5.21, A/2000.8.14: adult male, Mt. Tumpor, 3 March 2000	1
<i>Brachypteryx leucophrys langbianensis</i>	BMNH 2000.5.12, A/2000.8.7: adult male, Mt. Tumpor, 3 March 2000 BMNH A/2000.8.38: indeterminate, Mt. Tumpor, 29 February 2000	1
<i>Ficedula mugimaki</i>	BMNH 2000.5.44, A/2000.8.28: adult male, Mt. Khmaoch, 14 March 2000	1
<i>Eumyias thalassina thalassina</i>	BMNH 2000.5.50, A/2000.8.33: adult male, Mt. Tumpor, 4 March 2000	1
<i>Niltava grandis grandis</i>	BMNH 2000.5.51, A/2000.8.34: adult male, Mt. Tumpor, 2 March 2000 BMNH 2000.5.52, A/2000.8.35: adult female, Mt. Tumpor, 2 March 2000	2
<i>Pomatorhinus schisticeps klossi</i>	BMNH 2000.5.24, A/2000.8.17: juv. male, Mt. Tumpor, 3 March 2000 BMNH 2000.5.25: adult male, Mt. Tumpor, 29 February 2000 BMNH 2000.5.26, A/2000.8.18: adult male, Mt. Tumpor, 3 March 2000	2
<i>Napothera brevicaudata griseigularis</i>	BMNH 2000.5.27: adult male, Mt. Tumpor, 29 February 2000 BMNH 2000.5.28, A/2000.8.19: adult male, Mt. Tumpor, 4 March 2000 BMNH A/2000.8.48: indeterminate, Mt. Tumpor, 1 March 2000	1
<i>Pteruthius flaviscapis aeralatus</i>	BMNH 2000.5.33: adult male, Mt. Khmaoch, 20 March 2000 BMNH 2000.5.34: adult female, Mt. Khmaoch, 20 March 2000	-

These specimens are the first from Cambodia. Recent sight records also exist (Timmins and Men Soriyun 1998, Poole and Sun Hean 1999, Net Neath *et al.* 2001).

PYGMY WREN BABBLER *Phoepyga pusilla annamensis*
BMNH 2000.5.29, A/2000.8.20 Adult female collected at 1,270 m on Mount Tumpor on 2 March 2000. Maxilla 13.4 mm, wing 47 mm, tarsus 21 mm, tail 16 mm,

weight 11.5 g. Bill: upper mandible black, lower mandible whitish-slate, feet brownish-flesh, and iris dark brown.

BMNH 2000.5.30 Adult male collected at 1,250 m on Mount Tumpor on 29 February 2000. Maxilla 13 mm, wing 52 mm, tarsus 19 mm, tail 14 mm, weight 11 g. Bill black-horn, feet dull flesh-horn, iris black.

Subspecific determination was made by reference to the types of *Phoepyga pusilla annamensis* (Robinson

Table 3. Comparison of generic diversity across selected species guilds.

Species guild	Genera	No. of species in Cardamom Mountains	No. of species in Da Lat Plateau
Terrestrial omnivores	<i>Rheinardia</i>	0	1
	<i>Lophura</i>	1	1
	<i>Polyplectron</i>	0	1
Terrestrial insectivores	<i>Pitta</i>	1	2
	<i>Garrulax</i>	1	3
	<i>Pomatorhinus</i>	2	3
	<i>Jabouilleia</i>	0	1
	<i>Napothera</i>	1	2
	<i>Phoepyga</i>	1	1
Partially terrestrial insectivores	<i>Tesia</i>	1	1
	<i>Brachypteryx</i>	1	2
	<i>Myiomela</i>	1	1
Understorey sallying insectivores	<i>Nihava</i>	1	1
	<i>Ficedula</i>	1	2
Understorey folio-gleaning insectivores	<i>Macronous</i>	1	2
	<i>Stachyris</i>	0	1
Middle-storey sallying insectivores	<i>Harpactes</i>	1	1
	<i>Lacedo</i>	1	1
	<i>Psarisomus</i>	1	1
	<i>Serilophus</i>	1	1
Middle-storey folio-gleaning insectivores	<i>Dicrurus</i>	5	5
	<i>Alophoixus</i>	1	1
	<i>Cutia</i>	0	1
	<i>Crocias</i>	0	1
	<i>Minla</i>	1	1
	<i>Yuhina</i>	1	2
	<i>Alcippe</i>	0	3
	<i>Cissa</i>	1	2
Middle-storey bark-gleaning insectivores	<i>Sitta</i>	1	2
Middle-storey wood-boring insectivores	<i>Sasia</i>	1	1
	<i>Blythipicus</i>	1	1
Canopy sallying insectivores	<i>Nyctyornis</i>	1	1
Canopy insectivore/frugivores	<i>Chloropsis</i>	2	3
	<i>Hypsipetes</i>	1	2
Canopy nectarivore/insectivores/frugivores	<i>Aethopyga</i>	1	3
	<i>Cochoa</i>	1	1
	<i>Irena</i>	1	1
	<i>Megalaima</i>	2	3
	<i>Treron</i>	1	1
	<i>Ducula</i>	1	1
Canopy granivores	<i>Loxia</i>	0	1
	<i>Carduelis</i>	0	1
Stream-side sallying insectivores	<i>Enicurus</i>	1	2
Stream-side terrestrial omnivores	<i>Zoothera</i>	1	1
Total		42	68

and Kloss 1919: 591-592) and *P. p. harterti* (Robinson and Kloss 1918: 205). Both our specimens match *P. p. annamensis* having dorsally less rufous than *P. p. harterti* combined with buff lores, ear-coverts and the forehead differing in the colour of shoulders; in *P. p. pusilla* the shoulders and ear-coverts have the same colour (specimens studied: *P. p. annamensis* BMNH 1919.12.20.342 [syntype], 1919.12.20.341 [syntype], 1919.12.20.343 [paratype], MNHN 1940.901, 1940.902, 1940.903, USNM 278496, 359133, 361161; *P. p. harterti* BMNH 1927.4.18.1014 [holotype], 1906.7.23.26, 1906.7.23.27, 1906.7.23.28, 1936.4.12.1959, 1936.4.12.1960, USNM 534859; *P. p. pusilla* 66 specimens of the BMNH collection). However, the ventral parts of specimen BMNH 2000.5.30 do not match any other specimen in the NHM collection, but do match a single female from Sa Pa, Vietnam, collected by B. Bjorkegren on 30 December 1938 (MNHN 1940.902). Nevertheless, both specimens seem to be within the range of variation of the subspecies *P. p. annamensis* (compared with all existing subspecies). The male Cambodian specimen differs in having a white chin (feathers have a fine brown distal margin) combined with breast feathers all showing the central parts symmetrically in deep sepia (much darker than in all other specimens seen) margined with broad white and a thin brown line, giving an appearance of a scaly sepia-coloured breast-band. The female specimen had small

ovaries and was not in breeding condition, whilst the male was already in mating condition. These specimens are the first records of this species from Cambodia.

STRIPED TIT BABBLER *Macronous gularis versuricola/saraburiensis*

BMNH 2000.5.31, A/2000.8.21 Adult female collected at 1,400 m on Mount Khmaoch on 14 March 2000. Maxilla 12.9 mm, wing 54 mm, tarsus 19.7 mm, tail 52 mm, weight 11.8 g. Bill whitish-grey, feet yellowish-flesh, and iris creamish-pink.

This specimen is intermediate between *M. g. versuricola* from Siem Reap, Cambodia, and *M. g. saraburiensis* from eastern Thailand (Lat Bua Kao). Our specimen is ventrally citron-yellow and shows similar-sized, thin black median streaks on the throat consistent with *M. g. saraburiensis*, and laterally intensifying black streaks towards the ear-coverts as in *M. g. versuricola*. There is no other specimen in the NHM collection which shows these intermediate characters. Three specimens from Bokor, Elephant range, Cambodia, in the NHM collection (BMNH 1928.6.26.1320-1322) resemble *M. g. connectens* (cf. Kloss 1918: 207). The female was not in breeding condition.

BLUE-WINGED MINLA *Minla cyanouroptera rufodorsalis*

BMNH 2000.5.35 Adult female collected at 1,250 m on Mount Tumpor on 29 February 2000. Maxilla 13.3

Table 4. Bird taxa described from the Thailand-Cambodia Mountains EBA; RR = restricted-range (range <50,000 km²: Stattersfield *et al.* 1998); * restricted-range within Indochina but not endemic to the Cardamom Mountains *sensu lato* (cf. Steinheimer 2002).

Taxon	Distribution
CHESTNUT-HEADED PARTRIDGE <i>Arborophila cambodiana</i>	RR
SILVER PHEASANT <i>Lophura nycthemera lewisi</i>	RR
BLUE PITTA <i>Pitta cyanea aurantiaca</i>	RR
LONG-TAILED BROADBILL <i>Psarisomus dalhousiae cyanicauda</i>	*
GREY-CHINNED MINIVET <i>Pericrocotus solaris nassovicus</i>	RR
LESSER RACKET-TAILED DRONGO <i>Dicrurus remifer lefoli</i>	RR
WHITE-TAILED ROBIN <i>Myiomela leucura cambodiana</i>	RR
OCHRACEOUS BULBUL <i>Alophoixus ochraceus cambodianus</i>	*
MOUNTAIN BULBUL <i>Hypsipetes mccllellandii canescens</i>	RR
WHITE-TAILED LEAF WARBLER <i>Phylloscopus davisoni intensior</i>	RR
CAMBODIAN LAUGHINGTHRUSH <i>Garrulax ferrarius</i>	RR
WHITE-BROWED SCIMITAR BABBLER <i>Pomatorhinus schisticeps klossi</i>	RR
STREAKED WREN BABBLER <i>Napothera brevicaudata griseigularis</i>	RR
STRIPED TIT BABBLER <i>Macronous gularis saraburiensis</i>	*
BLUE-WINGED MINLA <i>Minla cyanouroptera rufodorsalis</i>	RR
RUFIOUS-THROATED FULVETTA <i>Alcippe rufogularis khmerensis</i>	*
MOUNTAIN FULVETTA <i>Alcippe peracensis eremita</i>	*
WHITE-BELLIED YUHINA <i>Yuhina zantholeuca canescens</i>	RR
FIRE-BREASTED FLOWERPECKER <i>Dicaeum ignipectus cambodianum</i>	RR
BLACK-THROATED SUNBIRD <i>Aethopyga saturata cambodiana</i>	RR

Table 5. A comparison of levels of endemism between EBAs within Indochina: RR = restricted-range species (range <50,000 km²; Startersfield *et al.* 1998).

Endemic Bird Area	RR confined	RR occurring	Threatened RR	Score (RR confined+ RR occurring+ Threatened RR)	Rank
Annamese Lowlands	3	7	2	12	5
Thailand-Cambodia Mountains	2	2	1	5	7=
Da Lat Plateau	3	8	2	13	3=
Eastern Himalayas	19	22	8	49	1
Irrawaddy Plains	2	2	1	5	7=
Kon Tum Plateau	3	8	2	13	3=
South-east Chinese Mountains	4	5	5	14	2
Southern Vietnamese Lowlands	2	2	2	6	6

mm, wing 65 mm, tarsus 24 mm, tail 67 mm, weight 19 g. Bill grey-horn upper mandible, flesh-horn lower mandible, feet pale horn, iris yellowish-white.

BMNH 2000.5.36, A/2000.8.23 Adult male enlarged testis (max. 5.1 x 4.2 mm) collected at 1,600 m on Mount Khmaoch on 15 March 2000. Maxilla 15 mm, wing 68 mm, tarsus 26 mm, tail 73 mm, weight 19 g. Bill whitish-horn, feet pale flesh, iris white. See Fig. 10.

Our two specimens were compared with the two syntypes of this very distinct subspecies (MNHN 1947.406 and 1947.407). Our specimens match very well the fuscous dorsal coloration. However, they differ slightly in having the ear-coverts blue greyish-buff (not fuscous), showing a less distinctive colour change to the sides of the nape. No significant difference is shown in any measurement. This is a very distinctive form and the species requires full revision since this and the form *M. c. orientalis* from the Da Lat Plateau EBA in Vietnam may warrant treatment as full species.

WHITE-BELLIED YUHINA *Yuhina zantholeuca canescens*
BMNH A/2000.8.49 Indeterminate collected at 1,250 m on Mount Tumpor on 29 February 2000.

BMNH A/2000.8.50 Indeterminate collected at 1,250 m on Mount Tumpor on 29 February 2000.

Our two spirit specimens were compared with the type specimen of this subspecies (BMNH 1928.6.26.9) and differ in having the forehead less grey-olive and lacking the buff tone in the olive colour of the neck similar to *Y. z. sordida*, but matching in all other characters the subspecies *Y. z. canescens*. A specimen (MNHN 1928.816) from Siem Reap shows all the characters of *Y. z. sordida*, suggesting that *Y. z. canescens* is, within Cambodia, confined to the Cardamom Mountains.

BLACK-THROATED SUNBIRD *Aethopyga saturata cambodiana*
BMNH A/2000.8.62 Adult male collected at 1,250 m on Mount Tumpor on 1 March 2000.

BMNH A/2000.8.63 Adult female collected at 1,250 m on Mount Tumpor on 1 March 2000.

The male specimen differs slightly in comparison with the male syntype (BMNH 1928.6.26.1578) of this

subspecies in having no purple in the crown, but pure blackish-blue, a character closer to *A. s. ochra*. Otherwise our specimen matches well the subspecies *A. s. cambodiana*, especially in the underpart coloration; therefore it is considered that the slight differences are within a possible variation of the latter subspecies.

DISCUSSION

The addition of 13 resident forest species to the list of birds in Cambodia has confirmed that the avifauna of the Cardamom Mountains was previously poorly known. The failure of previous collectors to obtain these species is likely to be because they are terrestrial or inhabit the lower storey (White-browed Piculet, Snowy-browed Flycatcher, Slaty-backed Flycatcher, Fujian Niltava, Grey-bellied Tesia and Pygmy Wren Babbler), or because they are small, upper-storey or canopy inhabitants (Little Pied Flycatcher, White-tailed Leaf Warbler, Chestnut-crowned Warbler, Plain-tailed Warbler), or because they are shy and occur at low population density (Dark-sided Thrush and Green Cochoa), or because they are nocturnal (Javan Frogmouth). Seasonality may be another contributing factor since three species (Slaty-backed Flycatcher, Fujian Niltava and Plain-tailed Warbler) are winter visitors and may not have been present during previous collecting expeditions. However, the failure to have collected such a conspicuous species as Large Scimitar Babbler is inexplicable unless its distribution is extremely patchy. The significant number of new resident forest species also reflects low levels of attention previously paid to this area by collectors.

Bird diversity

The low diversity of the avifauna was noted by Delacour who stated that ‘never before in Indochina had we collected on such poor ground’, and ‘the number of specimens obtained during our stay there was very small’ (Delacour 1929a). In comparison with the Da Lat Plateau EBA in Vietnam, which is located at the same latitude, the same guilds are present (Table 3, Eames

1995). However, generic diversity within the guilds differed and ten genera recorded on the Da Lat Plateau were absent from the Cardamom Mountains (see Table 3). It remains entirely possible that some of these genera, particularly *Stachyris* and *Alcippe*, were overlooked during our expedition. Across the 15 species guilds considered, in three there was parity in the number of species represented (middle-storey sallying insectivores, middle-storey wood-boring insectivores and canopy sallying insectivores). However, in 12 guilds there were more species in each guild in the Da Lat Plateau EBA (see Table 3). The factors most likely to have led to the evolution of this depauperate avifauna are the isolation from other ranges in Indochina, the relatively low height of the Cardamom Mountains and insufficient area at higher altitude. Perhaps the single greatest revelation during the expedition was the absence of an upper montane avifauna in the Cardamom Mountains. We had anticipated there would be a transition from lower montane to upper montane avifauna between 1,000 m and 1,500 m as there is on the Da Lat Plateau and elsewhere in Indochina. However, this was not the case, and lower montane forms such as Cambodian Laughingthrush were found at the summits of Mounts Tumpur and Khmaoch. This combined with the relatively small overall area of habitat above 1,500 m suggests that there are unlikely to be as yet undescribed forms inhabiting the higher parts of this mountain range.

Endemism

Table 4 lists bird taxa described from the Cardamom Mountains and associated mountains. This table can be considered a candidate list of endemic taxa and serves here as a basis for defining the level of bird endemism in the Thailand-Cambodia Mountains Secondary Area. Lack of knowledge of the taxonomic status of many of these taxa has led to under-estimation of the importance of this area as a centre for bird endemism (cf. Poole 1999) and resulted in the Thailand-Cambodia Mountains being defined as a Secondary Area by BirdLife International rather than an Endemic Bird Area (Stattersfield *et al.* 1998). This definition was based on the occurrence of a single restricted-range species: Chestnut-headed Partridge. Although Riley described *Garrulax ferrarius*, it was later subsumed within *G. strepitans*, first by Delacour and later by Deignan (Riley 1930, Delacour 1946, Deignan 1964), until it was resurrected by Round and Robson (2001). Thus, with two endemic species confined to the Thailand-Cambodia Mountains, the area now meets the minimum criteria for an EBA and should be considered to be of elevated conservation concern. Furthermore, on the basis of external morphology, both *Myiomela leucura cambodiana* and *Minla cyanouroptera rufodorsalis* are strong candidates for species status and their taxonomic status should be reviewed.

Table 5 places the Thailand-Cambodia Mountains EBA within a regional context by comparing its attributes with seven other EBAs in South-East Asia based on data from Stattersfield *et al.* (1998) updated to include additional data from BirdLife International (2001) and Eames and Sweet (in prep.). Part of each of the eight EBAs included in Table 4 extends into

Indochina, although in the cases of the Eastern Himalayas and South-east Chinese Mountains the area falling within the region is relatively small in comparison with the overall extent of the EBA. It can be clearly seen that the Thailand-Cambodia Mountains are ranked joint seventh from a total of eight sites. These results indicate that the Thailand-Cambodia Mountains EBA is not an important centre of bird endemism in Indochina.

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APPENDIX

Birds recorded in the Cardamom Mountains, Cambodia, 24 February to 21 March 2000

Site 1. 24-26 February 2000: Drive from Pursat town south to 12°10'N 103°01'30"E and then to 12°19'N 102°59'E. Lowland dry dipterocarp forest and semi-evergreen along permanent watercourses.

Site 2. 27 February to 7 March 2000: Mount Tumpor 12°22'N 103°02'E. Lower montane evergreen forest. Base camp at 1,250 m.

Site 3. 8-10 March 2000: Lowland evergreen and dry deciduous forest between Chamkar Chhrey and Dai Kraham villages and 1-3 km SE of Dai Kraham.

Site 4. 13-20 March 2000: Mount Khmaoch 12°09'45"N 103°00'45"E. Lower montane evergreen forest. Base camp at 1,450 m.

Site 5. 21 March 2000: Lowland evergreen and semi-evergreen forest between Mount Khmaoch and Pramaoy.

Species	1	2	Sites 3	4	5
CHINESE FRANCOLIN <i>Francolinus pintadeanus</i>	*				
BLUE-BREASTED QUAIL <i>Coturnix chinensis</i>		*			
CHESTNUT-HEADED PARTRIDGE <i>Arborophila cambodiana</i>		*		*	*
SCALY-BREASTED PARTRIDGE <i>Arborophila chloropus</i>		*	*		
RED JUNGLEFOWL <i>Gallus gallus</i>	*		*		
SILVER PHEASANT <i>Lophura nycthemera</i>				*	
GREEN PEA FOWL <i>Pavo muticus</i>	*				
WHITE-BROWED PICULET <i>Sasia ochracea</i>		*			
GREY-CAPPED PYGMY WOODPECKER <i>Dendrocopos canicapillus</i>	*				
WHITE-BELLIED WOODPECKER <i>Dryocopus javensis</i>	*				
GREATER YELLOWNAPE <i>Picus flavinucha</i>	*				
BLACK-HEADED WOODPECKER <i>Picus erythropygius</i>					*
GREY-HEADED WOODPECKER <i>Picus canus</i>	*				
COMMON FLAMEBACK <i>Dinopium javanense</i>	*				
BLACK-AND-BUFF WOODPECKER <i>Meiglyptes jugularis</i>				*	
GREAT SLATY WOODPECKER <i>Mulleripicus pulverulentus</i>	*				
LINEATED BARBET <i>Megalaima lineata</i>	*				
GREEN-EARED BARBET <i>Megalaima faiostricta</i>		*		*	
MOUSTACHED BARBET <i>Megalaima incognita</i>		*		*	
COPPERSMITH BARBET <i>Megalaima haemacephala</i>	*				
ORIENTAL PIED HORNBILL <i>Anthracoceros albirostris</i>			*		
GREAT HORNBILL <i>Buceros bicornis</i>		*		*foothills	
WREATHED HORNBILL <i>Aceros undulatus</i>				*foothills	
ORANGE-BREASTED TROGON <i>Harpactes oreskios</i>	*				
RED-HEADED TROGON <i>Harpactes erythrocephalus</i>	*	*		*	
INDIAN ROLLER <i>Coracias benghalensis</i>	*				
DOLLARBIRD <i>Eurystomus orientalis</i>	*		*		
BLUE-EARED KINGFISHER <i>Alcedo meninting</i>				*	*
BANDED KINGFISHER <i>Lacedo pulchella</i>	*				
STORK-BILLED KINGFISHER <i>Halcyon capensis</i>	*				
WHITE-THROATED KINGFISHER <i>Halcyon smyrnensis</i>	*				
BLUE-BEARDED BEE-EATER <i>Nyctyornis athertoni</i>				*	
GREEN BEE-EATER <i>Merops orientalis</i>	*				
LARGE HAWK CUCKOO <i>Hierococcyx sparverioides</i>				*	
INDIAN CUCKOO <i>Cuculus micropterus</i>	*	*		*	
BANDED BAY CUCKOO <i>Cacomantis sonneratii</i>	*				

Species	1	2	Sites 3	4	5
DRONGO CUCKOO <i>Surniculus lugubris</i>	*				
GREEN-BILLED MALKOHA <i>Phaenicophaeus tristis</i>	*				
CORAL-BILLED GROUND CUCKOO <i>Carpococcyx renauldi</i>				*	
GREATER COUCAL <i>Centropus sinensis</i>	*				
LESSER COUCAL <i>Centropus bengalensis</i>	*				
VERNAL HANGING PARROT <i>Loriculus vernalis</i>	*	*			
BLOSSOM-HEADED PARAKEET <i>Psittacula roseata</i>	*				
RED-BREASTED PARAKEET <i>Psittacula alexandri</i>	*		*		
ASIAN PALM SWIFT <i>Cypsiurus balasiensis</i>	*				
FORK-TAILED SWIFT <i>Apus pacificus</i>				*	
CRESTED TREESWIFT <i>Hemiprocne longipennis</i>	*				
MOUNTAIN SCOPS OWL <i>Otus spilocephalus</i>		*		*	
COLLARED SCOPS OWL <i>Otus bakkamoena</i>	*				
BROWN WOOD OWL <i>Strix leptogrammica</i>		*			
COLLARED OWLET <i>Glaucidium brodiei</i>	*	*			
ASIAN BARRED OWLET <i>Glaucidium cuculoides</i>	*				
BROWN HAWK OWL <i>Ninox scutulata</i>	*				
JAVAN FROGMOUTH <i>Batrachostomus javensis</i>				*	
GREAT EARED NIGHTJAR <i>Eurostopodus macrotis</i>	*		*		
GREY NIGHTJAR <i>Caprimulgus indicus</i>		*			
LARGE-TAILED NIGHTJAR <i>Caprimulgus macrurus</i>	*				
SPOTTED DOVE <i>Streptopelia chinensis</i>	*				
RED COLLARED DOVE <i>Streptopelia tranquebarica</i>					
BARRED CUCKOO DOVE <i>Macropygia unchall</i>		*		*	
EMERALD DOVE <i>Chalcophaps indica</i>	*				
THICK-BILLED GREEN PIGEON <i>Treron curvirostra</i>	*	*			
YELLOW-FOOTED GREEN PIGEON <i>Treron phoenicoptera</i>	*				
MOUNTAIN IMPERIAL PIGEON <i>Ducula badia</i>		*		*	
EURASIAN WOODCOCK <i>Scolopax rusticola</i>		*			
RED-WATTLED LAPWING <i>Vanellus indicus</i>	*				
BLACK BAZA <i>Aviceda leuphotes</i>	*		*		
ORIENTAL HONEY-BUZZARD <i>Pernis ptilorhyncus</i>	*				
CRESTED SERPENT EAGLE <i>Spilornis cheela</i>		*			
CRESTED GOSHAWK <i>Accipiter trivirgatus</i>		*			
SHIKRA <i>Accipiter badius</i>	*				
BESRA <i>Accipiter virgatus</i>		*			
RUFIOUS-WINGED BUZZARD <i>Butastur liventer</i>	*				
HAWK EAGLE <i>Spizaetus</i> sp.		*			
JAVAN POND HERON <i>Ardeola speciosa</i>			*		
BLUE PITTA <i>Pitta cyanea</i>				*	
DUSKY BROADBILL <i>Corydon sumatranus</i>	*				
BANDED BROADBILL <i>Eurylaimus javanicus</i>	*				
SILVER-BREASTED BROADBILL <i>Serilophus lunatus</i>		*			
LONG-TAILED BROADBILL <i>Psarisomus dallhousiae</i>		*			
ASIAN FAIRY BLUEBIRD <i>Irena puella</i>	*				

Species	1	2	Sites 3	4	5
GOLDEN-FRONTED LEAFBIRD <i>Chloropsis aurifrons</i>	*				
BURMESE SHRIKE <i>Lanius collurioides</i>	*				
RED-BILLED BLUE MAGPIE <i>Urocissa erythrorhyncha</i>	*				
INDOCHINESE GREEN MAGPIE <i>Cissa hypoleuca</i>		*		*	
RUFIOUS TREEPIE <i>Dendrocitta vagabunda</i>	*				
LARGE-BILLED CROW <i>Corvus macrorhynchos</i>	*				
ASHY WOODSWALLOW <i>Artamus fuscus</i>	*				
BLACK-HOODED ORIOLE <i>Oriolus xanthornus</i>	*				
LARGE CUCKOOSHRIKE <i>Coracina macei</i>	*				
INDOCHINESE CUCKOOSHRIKE <i>Coracina polioptera</i>				*	
BLACK-WINGED CUCKOOSHRIKE <i>Coracina melaschistos</i>		*			
SWINHOE'S MINIVET <i>Pericrocotus cantonensis</i>				*	
SMALL MINIVET <i>Pericrocotus cinnamomeus</i>					*
GREY-CHINNED MINIVET <i>Pericrocotus solaris</i>		*			
SCARLET MINIVET <i>Pericrocotus flammeus</i>	*		*		
BAR-WINGED FLYCATCHER-SHRIKE <i>Hemipus picatus</i>	*				
WHITE-THROATED FANTAIL <i>Rhipidura albicollis</i>		*		*	
ASHY DRONGO <i>Dicrurus leucophaeus</i>	*			*	
BRONZED DRONGO <i>Dicrurus aeneus</i>	*				
LESSER RACKET-TAILED DRONGO <i>Dicrurus remifer</i>		*		*	
SPANGLED DRONGO <i>Dicrurus hottentottus</i>	*				
GREATER RACKET-TAILED DRONGO <i>Dicrurus paradiseus</i>	*		*		
BLACK-NAPED MONARCH <i>Hypothymis azurea</i>	*			*	
COMMON IORA <i>Aegithina tiphia</i>	*				
LARGE WOODSHRIKE <i>Tephrodornis gularis</i>	*				
ORANGE-HEADED THRUSH <i>Zoothera citrina</i>		*			
DARK-SIDED THRUSH <i>Zoothera marginata</i>		*			
EYEBROWED THRUSH <i>Turdus obscurus</i>		*			
LESSER SHORTWING <i>Brachypteryx leucophrys</i>		*		*	
ASIAN BROWN FLYCATCHER <i>Muscicapa dauurica</i>				*	
MUGIMAKI FLYCATCHER <i>Ficedula mugimaki</i>				*	
SLATY-BACKED FLYCATCHER <i>Ficedula hodgsonii</i>		*			
SNOWY-BROWED FLYCATCHER <i>Ficedula hyperythra</i>		*		*	
LITTLE PIED FLYCATCHER <i>Ficedula westermanni</i>		*			
VERDITER FLYCATCHER <i>Eumyias thalassina</i>		*			
LARGE NILTAVA <i>Niltava grandis</i>		*		*	
FUJIAN NILTAVA <i>Niltava davidi</i>		*			
ORIENTAL MAGPIE ROBIN <i>Copsychus saularis</i>	*				
WHITE-RUMPED SHAMA <i>Copsychus malabaricus</i>	*				
WHITE-TAILED ROBIN <i>Myiomela leucura</i>		*		*	
SLATY-BACKED FORKTAIL <i>Enicurus schistaceus</i>		*			
GREEN COCHOA <i>Cochoa viridis</i>		*			
COMMON STONECHAT <i>Saxicola torquata</i>	*				
BLACK-COLLARED STARLING <i>Sturnus nigricollis</i>	*				
GOLDEN-CRESTED MYNA <i>Ampeliceps coronatus</i>			*		

Species	1	2	Sites 3	4	5
HILL MYNA <i>Gracula religiosa</i>	*		*		
CHESTNUT-BELLIED NUTHATCH <i>Sitta castanea</i>			*	*	
VELVET-FRONTED NUTHATCH <i>Sitta frontalis</i>		*			
PACIFIC SWALLOW <i>Hirundo tahitica</i>				*	
ASIAN HOUSE MARTIN <i>Delichon dasypus</i>		*		*	
BLACK-HEADED BULBUL <i>Pycnonotus atriceps</i>			*		
BLACK-CRESTED BULBUL <i>Pycnonotus melanicterus</i>				*	
RED-WHISKERED BULBUL <i>Pycnonotus jocosus</i>	*			*	
SOOTY-HEADED BULBUL <i>Pycnonotus aurigaster</i>	*				
STRIPE-THROATED BULBUL <i>Pycnonotus finlaysoni</i>				*	
STREAK-EARED BULBUL <i>Pycnonotus blanfordi</i>	*			*	
OCHRACEOUS BULBUL <i>Alophoixus ochraceus</i>					*
BULBUL <i>Alophoixus</i> sp.		*			
GREY-EYED BULBUL <i>Iole propinqua</i>				*	
MOUNTAIN BULBUL <i>Hypsipetes mccllellandii</i>		*		*	
BROWN PRINIA <i>Prinia polychroa</i>	*				
GREY-BREASTED PRINIA <i>Prinia hodgsonii</i>	*				
ORIENTAL WHITE-EYE <i>Zosterops palpebrosus</i>		*			
GREY-BELLIED TESIA <i>Tesia cyaniventer</i>		*		*	
COMMON TAILORBIRD <i>Orthotomus sutorius</i>	*				
DARK-NECKED TAILORBIRD <i>Orthotomus atrogularis</i>				*	
YELLOW-BROWED WARBLER <i>Phylloscopus inornatus</i>		*			
WHITE-TAILED LEAF WARBLER <i>Phylloscopus davisoni</i>		*		*	
GREY-CROWNED WARBLER <i>Seicercus tephrocephalus</i>		*			
PLAIN-TAILED WARBLER <i>Seicercus soror</i>		*		*	
CHESTNUT-CROWNED WARBLER <i>Seicercus castaniceps</i>		*			
WHITE-CRESTED LAUGHINGTHRUSH <i>Garrulax leucolophus</i>	*				
CAMBODIAN LAUGHINGTHRUSH <i>Garrulax ferrarius</i>		*		*	
PUFF-THROATED BABBLER <i>Pellorneum ruficeps</i>			*		
LARGE SCIMITAR BABBLER <i>Pomatorhinus hypoleucos</i>		*		*	
WHITE-BROWED SCIMITAR BABBLER <i>Pomatorhinus schisticeps</i>		*		*	
STREAKED WREN BABBLER <i>Napothera brevicaudata</i>		*		*	
PYGMY WREN BABBLER <i>Pnoepyga pusilla</i>		*		*	
STRIPED TIT BABBLER <i>Macronous gularis</i>	*	*		*	
WHITE-BROWED SHRIKE BABBLER <i>Pteruthius flaviscapis</i>		*		*	
BLUE-WINGED MINLA <i>Minla cyanouroptera</i>		*		*	
WHITE-BELLIED YUHINA <i>Yuhina zantholeuca</i>		*			
BLACK-THROATED SUNBIRD <i>Aethopyga saturata</i>		*		*	
LITTLE SPIDERHUNTER <i>Arachnothera longirostra</i>				*	
GREY WAGTAIL <i>Motacilla cinerea</i>	*	*			
OLIVE-BACKED PIPIT <i>Anthus hodgsoni</i>		*			